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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/998,073	11/30/2001	Gurtej S. Sandhu	MIO 0034 PA	4531

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EXAMINER

WINTER, GENTLE E

ART UNIT

PAPER NUMBER

1746

7

DATE MAILED: 08/07/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/998,073

Applicant(s)

SANDHU ET AL.

Examiner

Gentle E. Winter

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 June 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 46-69 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 46-69 is/are rejected.
- 7) ☒ Claim(s) 58, and 66-68 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Objections—Maintained/Withdrawn and New

1. Claims 50, 52, 58, and 62-63 were objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim.
2. In response to the objection the Applicants amended claims 50, 52, and 58, and argued:
[Applicants] now believe that they are now in proper dependant from, including structural limitations.
3. The argument is persuasive with respect to claims 50 and 52. The argument is not persuasive with respect to claim 58.
4. As to claim 50, the source must predominately produce UV radiation. All electromagnetic radiation sources produces some UV radiation.
5. As to claim 52, the recitation of a electromagnetic radiation convergent point between two and four millimeters above the surface of the workpiece requires structure in the lens such that the indicated result is obtained.
6. As to claim 58, the type of gas does not impart structure.
7. With respect to claims 61-63 Applicants argue:

Claim 61 further limits the inlet structure of claim 46 by reciting that it is configured to provide the gaseous constituent in a layer, specifically a layer about 10 millimeters or less in thickness.
8. The argument is persuasive and the objection is withdrawn. There is, of necessity, in the claimed system, a nozzle configuration that would provide the indicated results. Thus there is a proper structural limitation in the claim.

Similarly, claim 62 requires that the configuration of the inlet structure is such that the location of the converging beam of electromagnetic radiation takes place in the gaseous constituent layer.

9. The argument is not persuasive. The recitation that the convergence takes place in the gaseous layer, without indicating where the gaseous layer is, does not impart additional structure. The beam is already disclosed to converge in claim 46.

Claim 63 state that the configuration of the inlet structure is such that the gaseous atmosphere being supplied by gas through the inlet structure is predominately transmission gas.

10. The argument is not persuasive. The nature of the gas supplied is of limited relevance.

11. New claims 66-68 are objected to for failing to further limit their base claims. The recitation of gas species is not a proper structural limitation of the apparatus, and electromagnetic radiation is already of a predetermined wavelength.

12. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Specifically, claim 50, the recitation of specific wavelengths goes to a future intended use, the light is not operating except when in use. As to claim 52, the claim discloses a variable, contingent on the type of gas used and how the optics are arranged. As to claim 58, the type of gas is not a structural limitation. As to claims 62-63, the system of United States Patent No. 5,669,979 to Elliot could perform the recited functions when in operation.

Response To Arguments

13. Applicant points to *Verdegaal Brothers Inc. v. Union Oil Company of California* 2 USPQ2d 1051 and asserts that the same stands for the proposition: “to be valid as anticipatory prior art, a reference must disclose every element and limitation of a claim.” More accurately, the Court stated: “A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” At 1053, citing

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Structural Rubber Prods. Co. v. Park Rubber Co., 749 F.2d 707, 715, 223 USPQ 1264, 1270

(Fed. Cir. 1984).

14. Applicant continues:

In the instant case, claim 46 (both in its original form and presently) includes the feature that the beam produced by the radiation source converges “in close proximity to the surface of the workpiece”, but is also “spaced a finite distance therefrom”. This is clearly distinguished from the device of the Elliot patent, where the system is configured to have the beam act on the surface”. New claim 64 further recites these features in the context of a gaseous constituent layer disposed between the transmission gas layer and the surface of the workpiece. The Elliot patent fails to teach or suggest these features, and as such is invalid as an anticipatory reference. Moreover, since neither Elliot nor any art in the cited Information Disclosure Statement (IDS) even contemplates the production of an active species by a beam of radiation that converges above (rather than on) the workpiece surface, any obviousness rejection based thereon would also be improper.

15. The arguments attempt to distinguish the present invention based on its function.

Namely, the fact that the radiation beam converges above the substrate. Function is an acceptable means of imparting structure. However a reference capable of performing the same function and possessing the same structure will provide a proper anticipation rejection. In the instant case, it appears that the beam does begin to converge above the substrate being treated; additionally the point of convergence is adjustable in Elliot, and presumably in the present invention as well. Applicant may be correct in the assertion that the prior art of record has failed to recognize the benefits discovered by applicant, or does not use their device in the manner that applicant contemplates. Even accepting these arguments, the current claims would not be allowable. However, the *method* of converging the beam above the substrate, where the point of convergence is above the substrate may be novel. It is not clear how the present invention structurally differs from the cited reference. As such, unfortunately, the rejection must be maintained at this time.

Claim Rejections - 35 USC § 102—Maintained/New

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

16. Claims 46-69 are rejected under 35 U.S.C. 102(b) as being anticipated by United States Patent No. 5,669,979 to Elliot et al. (Elliot).

17. As an initial matter, the claims are drawn to a “system”. A "system" is an "apparatus." See *Ex parte Alfred A. Fressola* 27 U.S.P.Q.2d 1608 citing *In re Walter*, 618 F.2d 758, 762 n.2, 205 USPQ 397, 402 n.2 (CCPA 1980). As such, only structural limitations, or structural imparting functions are construed to properly limit the claims.

18. With specific respect to claims 46 and 64 requiring an “inlet”, presumably into some containment structure, for exposing a workpiece to gas. A radiation beam source adapted to converge in close proximity to the surface of the workpiece. Figure 15 of Elliot discloses, in figure 15, and associated text, an inlet (not shown but feeding element 434 which is a nozzle). The workpiece is disclosed as element 414. The radiation source (element 422) is disclosed as a laser. The beam is shown to converge at the workpiece see element 416.

19. As to claim 47 disclosing optics to focus the beam, element 428 is an optical focusing element, more specifically, a cylindrical mirror.

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20. As to claim 48, disclosing a structure for causing relative motion between the surface and the beam, the stage (element 440) is disclosed to translate the chuck (element 436) and substrate (element 414) at a constant rate across the reaction chamber from a rear end (element 476) to a forward end (element 478). This translation provides the requisite relative motion.

21. As to claim 49, disclosing a chamber having a window. The chamber (or containment system) was generally presumed to exist in claim 46. The chamber and window are similarly disclosed in figure 15. The chamber does not appear to be numbered but is explicitly disclosed at e.g. column 20, line 18 *et seq.* the window is explicitly disclosed, as such at see e.g. column 20, line 41 *et seq.* disclosing: “the chamber may have a flat window, with the converging lens or mirror located outside the chamber.”

22. As to claim 50, disclosing that the source of electromagnetic radiation produces UV radiation. The same is disclosed in Elliot see e.g. column 10, line 17 *et seq.* disclosing “... a pair of mirrors 50 and 52 could be arranged to act cooperatively on an incoming light beam 54 generated by a deep UV light source...”.

23. As to claim 51, disclosing that the optics are such that beam convergence makes a “wide scanning beam”, the same is identically disclosed in *inter alia*, figures 2 and 2A. Referring to FIGS. 2 and 2A, the elongated dimension 46 of beam 42 at a substrate surface is selected based largely upon the size of the substrate to be cleaned. Thus the final beam striking the surface

gives the appearance of a knife-edge. Alternatively, flat mirror 40, may be replaced by a cylindrical focusing mirror 41, as shown in FIG. 2A. See e.g. column 9, line 66 *et seq.*

24. As to claim 52, disclosing that the point of convergence is between about 2 and 4 millimeters. The arrangement of the optics is disclosed in figure 2A and relevant associated text. In a larger sense, the height of the sample may be adjusted for virtually any separation. This claim very narrowly further limits its base claim structurally.

25. As to claim 53 disclosing an exhaust pump. The same is disclosed in figure 11 and associated text see e.g. column 17, line 38 *et seq.* Specifically an exhaust nozzle (element 292 in FIG. 11) is coupled to a vacuum pump (element 294) and provides a high velocity exhaust near the cloud of ablated foreign material to evacuate the reacted and unreacted ablation components in the cloud.

26. As to claim 54, disclosing a nozzle. The nozzle is disclosed as element 434, in figure 15 and in associated text. The nozzle inherently could deliver a laminar flow, depending *inter alia* on the flowrate. Turbulence is a function of flowrate.

27. As to claim 55, disclosing a heater for heating the workpiece. As an initial matter the light source would heat the workpiece and as such the heater could be the light source. Nonetheless, figure 11A at element 284 and associated text discloses a heating element.

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28. As to claims 56 and 61, disclosing a temperature sensor, a pressure sensor, and a gas sensor, the same are disclosed at e.g. column 6, line 6. Elliot discloses that the process is carefully controlled. The controlled process aspects include the input fluid composition, temperature, and pressure. Inherent in controlling the same, is a means for monitoring the variables.

29. As to claim 57, disclosing a mixing chamber, element 524 in figure 16, and associated text, discloses the same, in the context of the claimed system.

30. As to claim 60, disclosing a holder for the substrate, a chuck (element 436) is disclosed in figure 15 and associated text.

31. As to claim 65, disclosing that the gas flow is laminar, the same is disclosed in Elliot. Specifically, Elliot discloses: “in one configuration, the reaction chamber is fitted on one end with an ‘intake’ gas manifold and on the other with an ‘exhaust’ manifold which creates laminar flow of gas through a very narrow, low profile (and hence low volume) reaction chamber.” See e.g. column 20, line 52 *et seq.*

32. As to claim 69, disclosing that the wavelength is between 190 and 250 nm. Elliot discloses that the beam may include ultra-violet radiation in the wavelength range 4 nm to 380 nm. See e.g. column 3, lines 1-17.

Conclusion

Applicant's amendment(s) and addition of claims necessitated the new/additional ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gentle E. Winter whose telephone number is (703) 305-3403. The examiner can normally be reached on Monday-Friday 7:00-3:30.

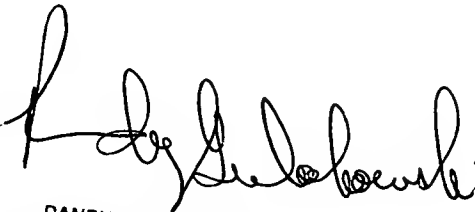
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy P. Gulakowski can be reached on (703) 308-4333. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications. The direct fax number for this examiner is (703) 746-7746.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Gentle E. Winter
Examiner
Art Unit 1746

August 6, 2003



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